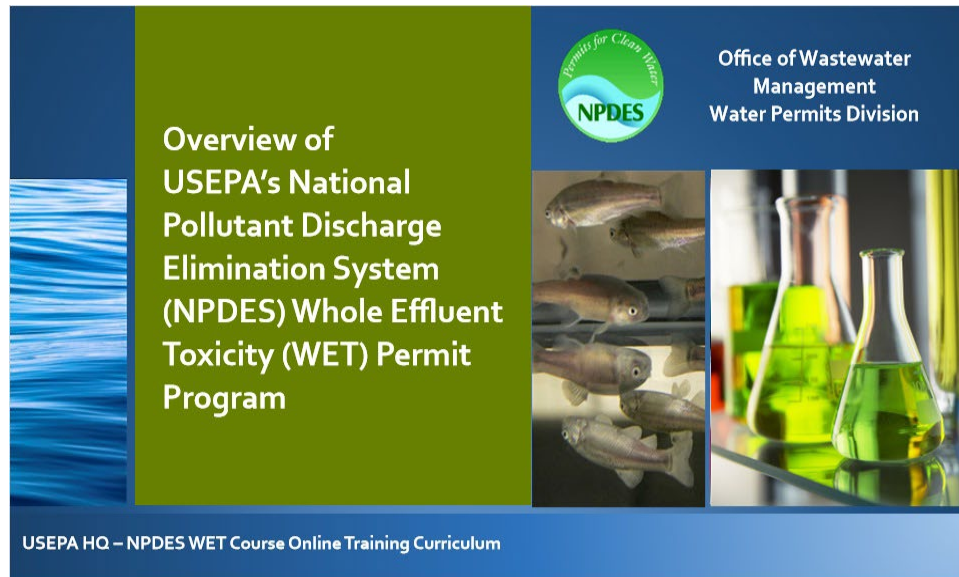


Module 1 - Overview of USEPA NPDES WET Permit Program



Notes:

Welcome to this Overview of the United States Environmental Protection Agency's, hereafter EPA, National Pollutant Discharge Elimination System Whole Effluent Toxicity Permit Program. This presentation is part of a web-based training series on Whole Effluent Toxicity, or WET, sponsored by EPA's Office of Wastewater Management's Water Permits Division.

You can review this stand-alone presentation, or, if you have not already done so, you might also be interested in viewing the other presentations in this series, which cover the use of WET in the NPDES permit program.

Before we get started with this presentation, I have some important housekeeping items.

Presenter

Laura Phillips
EPA NPDES WET Coordinator
U.S. Environmental Protection Agency
Washington, D.C.



Reference: EPA
Toxicity Test Methods

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Notes:

First, let me introduce myself. My name is Laura Phillips, and I am the EPA's NPDES WET Coordinator with the Water Permits Division within the Office of Wastewater Management at EPA Headquarters in Washington, D.C. Second, now for the housekeeping items.

You should be aware that all the materials used in this presentation have been reviewed by EPA staff for technical and programmatic accuracy; however, the views of the speakers are their own and do not necessarily reflect those of EPA. The NPDES permit program, which includes the use of toxicity testing, is governed by the existing requirements of the Clean Water Act and EPA's NPDES permit implementation regulations. These statutory and regulatory provisions contain legally binding requirements. However, the information in this presentation is not binding. Furthermore, it supplements, and does not modify, existing EPA policy and guidance on WET in the NPDES permit program. EPA may revise and/or update the contents of this presentation in the future.

Throughout this module, the term "state" means a state, the District of Columbia, the territories including the Commonwealth of Puerto Rico, the United States Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, and the Trust Territory of the Pacific Islands and Tribes (40 CFR Part 122.2). The term "authorized Tribe" means those federally recognized Indian Tribes with authority to administer a Clean Water Act water quality standards, WQS, program. In some instance we may use the term "permitting authority" to include EPA, states, territories, and Tribes that have been authorized to administer the NPDES permit

program.

This module was developed based on the live EPA Headquarters' NPDES WET course that the Water Permits Division of the Office of Wastewater Management has been teaching to EPA regions, states, territories and authorized Tribes. This course, where possible, has been developed with both the non-scientist and scientist in mind. Also, while not necessary, a basic knowledge of biological principles and WET will be helpful to the viewer. Prior to this course, a review of EPA's NPDES Permit Writers' online course, which is available at EPA's NPDES training website, is recommended. See the "Resources" tab for a link to the NPDES training website.

When appropriate a blue button will appear on a slide to provide access to more information. By clicking this button, additional slides will present information regarding either freshwater or marine EPA toxicity test methods. When these additional slides are finished, you will be automatically returned to the module slide where you left off. The blue button on this slide provides the references for EPA's toxicity test methods that will be presented throughout this module.

Now, let's review the use of Whole Effluent Toxicity in the NPDES permit program.

Clean Water Act - 1972


Section 101 (a) and (a)(2):

(a) The objective of this Act is to restore and maintain the chemical, physical, and **biological integrity** of the Nation's waters. In order to achieve this objective, it is hereby declared that, consistent with the provisions of this Act –

(a)(2) It is the national goal that wherever attainable, an interim goal of water quality which provides for the **protection and propagation** of fish, shellfish, and wildlife and provides for the recreation in and on the water be achieved by July 1, 1983

Section 301(b)(1)(C):

(C) Not later than July 1, 1977, any more stringent limitation, including those necessary to meet water quality standards, treatment standards, or schedule of compliance, established pursuant to any State law or regulations, (under authority preserved by section 510) or any other Federal law or regulation, or required to implement any applicable water quality standard established pursuant to this Act.

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Notes:

Many of the requirements that the EPA has placed into the NPDES permit program are there because of the Clean Water Act of 1972. The use of WET in the NPDES permit program stems directly from the Clean Water Act including Sections 101 and 301.

Section 101 (a) of the Clean Water Act indicates that the objective of the Act is to restore and maintain the chemical, physical, and **biological integrity** of the Nation's waters. Section (a) continues in paragraph (a)(2) by indicating that it is a national goal that wherever attainable, the interim water quality goal is to provide for the **protection and propagation** of fish, shellfish, and wildlife and to provide for the recreation in and on the water is to be achieved by July 1, 1983. These two paragraphs in the Clean Water Act are the statutory goals underlying EPA's NPDES WET program.

The statutory basis for requiring the implementation of WET limits in NPDES permits is section 301(b)(1)(C) of the Act, which requires that permits include limits as stringent as necessary to meet state water quality standards. Most state water quality standards include chronic sub-lethal endpoints to meet the Clean Water Act's statutory goal for the protection and propagation of fish, shellfish, and wildlife. Thus, the chronic sub-lethal toxicity endpoints such as growth and reproduction, as reflected in the state water quality standards, are used in the NPDES permits program to protect the propagation of aquatic life.

Reasonable Potential (RP)
40 CFR 122.44(d)(1)(i)

Limitations must control all pollutants or pollutant parameters that are or may be discharged at a level which will *cause, have the reasonable potential to cause, or contribute to* an excursion above any State water quality standards (WQS).



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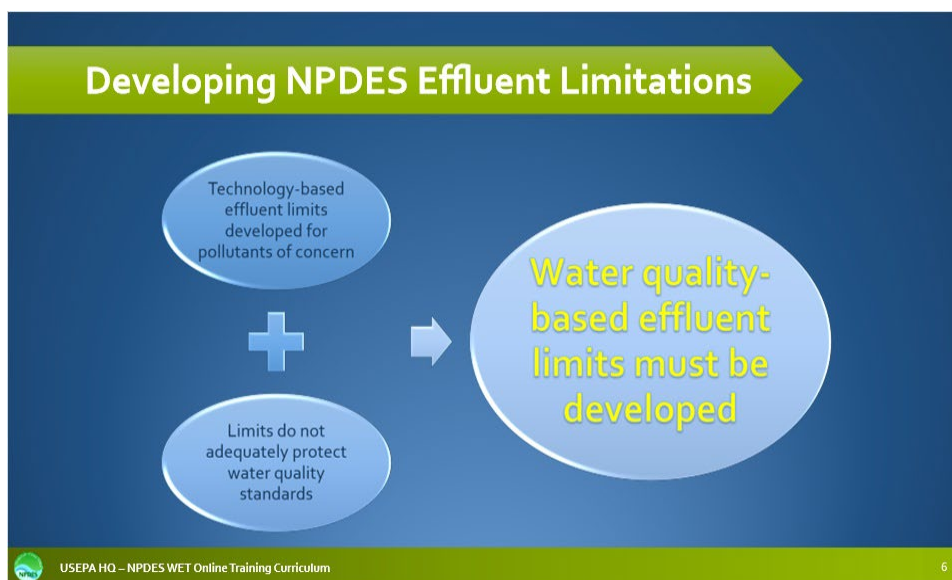
Notes:

EPA's NPDES permit regulations located in the U.S. Code of Federal Regulations, Title 40, hereafter 40 CFR, interprets and implements the Clean Water Act. Based on the Clean Water Act's provisions to protect the biological integrity of the nation's waters, the EPA regulations require that all effluent discharges to the waters of the U.S. be assessed to determine whether there is the reasonable potential, or RP, for an excursion of state water quality standards, such as the aquatic life protection criteria. The reasonable potential assessment for toxic impacts to aquatic life due to permitted effluent discharges at a level that would result in an excursion of applicable WET water quality standards is used to determine whether controls, such as NPDES WET permit limits, are necessary for wastewater discharges to surface waters. 40 CFR 122.44(d)(1)(i) requires limitations to control all pollutants or pollutant parameters that are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard. The potential to cause or contribute to an excursion of a state water quality standard is the provision that provides preventive protection before there is an impact to aquatic organisms at a level that would result in an excursion of applicable WET water quality standard. Sometimes the words excursion and exceedance are used interchangeably; but based on the EPA's NPDES regulatory provisions, there is a specific application of these terms. When discussing NPDES water quality protection, it is important to remember that the term excursions is used with respect to water quality standards and that the term exceedance is used with respect to violations of NPDES permit limitations.

Technology and Water Quality-based Effluent Limits		
Basis:	Technology (e.g., secondary treatment)	Water Quality
Goal:	"Zero Discharge of Pollutants" CWA 101(a)(1)	"Fishable/Swimmable" CWA 101(a)(2)
Reg. Cite:	40 CFR 122.44(a)&(e) 40 CFR 125.3	40 CFR 122.44(d)
Relationship:	Technology-based effluent limits are developed for all applicable pollutants of concern. If these limits are not adequate to protect water quality, then: water quality-based effluent limits must be developed.	

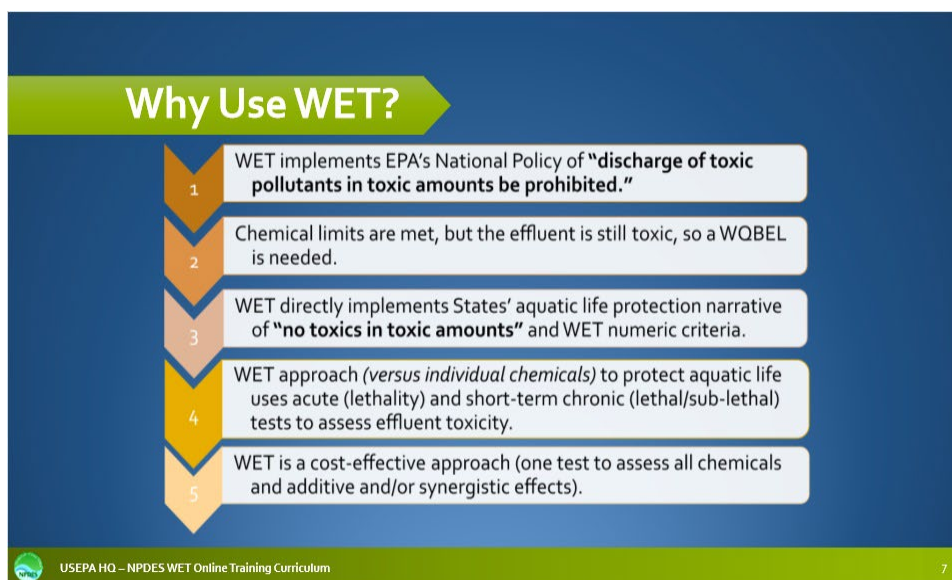
Notes:

NPDES permit limitations may be technology-based or water quality-based. The NPDES regulations for the incorporation of both technology-based and water quality-based effluent limits are included in the federal NPDES permit regulations as cited on this slide. The goal of technology-based effluent limits is to have a zero discharge of pollutants and these types of NPDES permit limits are developed for all applicable pollutants of concern. If these permit limits are not sufficient to protect water quality pursuant to a state's relevant water quality standard, such as for WET, then a water quality-based effluent limit must be developed. For instance, if technology-based limits are not controlling the toxicity of the effluent such that there is still an excursion of applicable WET water quality standard, as demonstrated by toxicity monitoring, then a water quality-based NPDES permit limit is required.



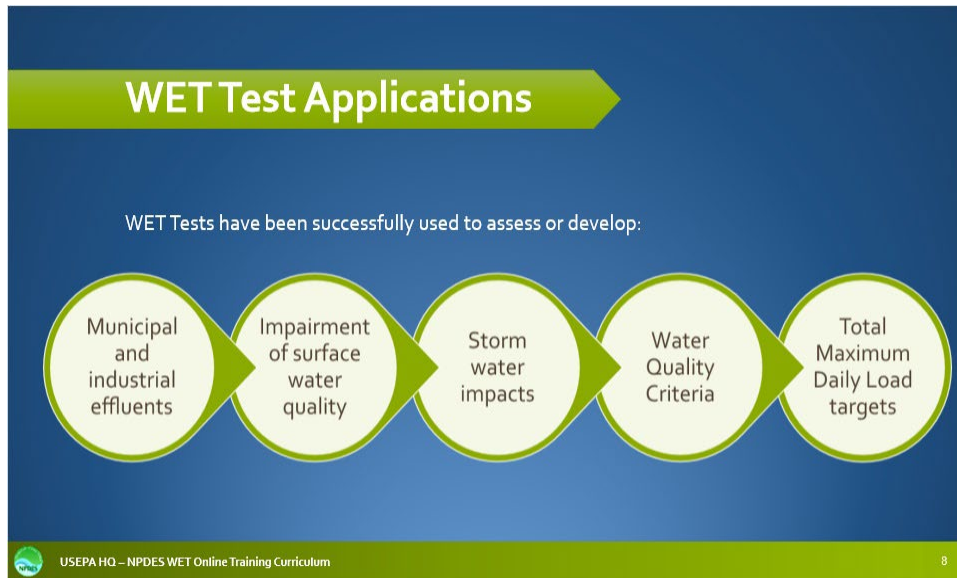
Notes:

This slide illustrates the NPDES regulatory approach just discussed using a decision tree when developing NPDES effluent limitations. First, technology-based effluent limits for all pollutants of concern are developed. Then, it is determined whether the limits will assure compliance with applicable state water quality standards. In terms of WET, the water quality standard is based on the aquatic life protection water quality criteria. If the technology-based limits will protect the applicable state water quality standards, then those limits are included in the NPDES permit. But if the technology-based limits will not protect applicable WET water quality standards, then water quality-based effluent limits, or WQBELs, are required to be developed.



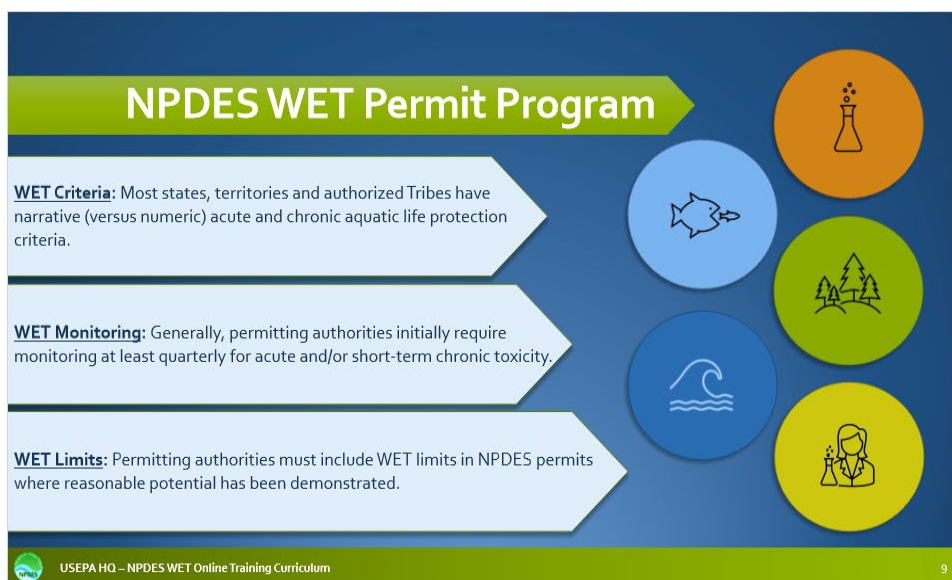
Notes:

So why use WET? WET directly supports the implementation of EPA's National Policy, which prohibits the discharge of toxic pollutants in toxic amounts. As mentioned on a previous slide, if chemical limits are met, but the effluent is measured as still toxic, then a water quality-based effluent limit, such as an NPDES WET limit, must be developed. Thus, the incorporation of WET as a water quality-based effluent limit directly implements the state's narrative aquatic life protection criteria of "no toxics in toxic amounts" or WET numeric criteria when a state has developed a numeric WET water quality standard. Numeric WET water quality standards will be discussed in detail later in this module. The WET approach can be a more cost-effective assessment than individual chemical monitoring since toxicity tests assess the cumulative effects of all chemicals in the effluent, including the potential for additive and/or synergistic effects.



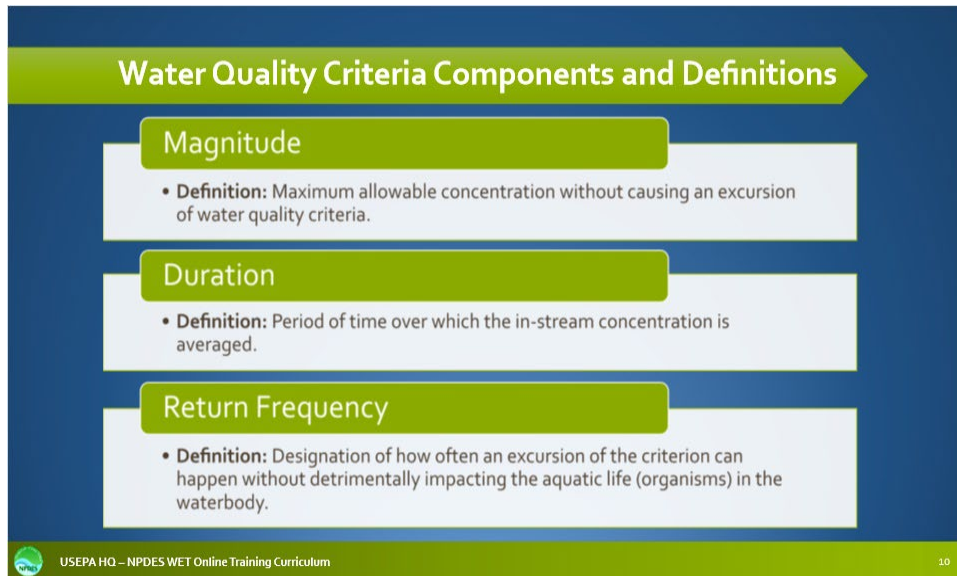
Notes:

How is WET testing applied? WET testing has been successfully used to assess: the toxicity of municipal and industrial effluents, water quality impairments of surface waters, possible storm water impacts, and development of water quality criteria for specific chemicals and total maximum daily load, or TMDL, targets. Next, let's take a closer look at how municipal and industrial effluents can be assessed for possible toxic impacts to aquatic organisms under the NPDES WET permit program.



Notes:

The key factors with respect to the NPDES WET permit program are aquatic life protection or WET criteria, representative toxicity monitoring and NPDES WET limits developed to be protective of applicable WET water quality standards. In terms of WET criteria adopted by states, territories, and authorized Tribes, most have included narrative WET criteria, such as “no toxics in toxic amounts,” into their water quality standards as previously mentioned. Some states include numeric criteria instead of narrative, and this WET implementation approach will be discussed later in this module. In terms of toxicity monitoring, permitting authorities initially require at least quarterly monitoring for acute and/or chronic toxicity, including for chronic sub-lethal endpoints. There can be instances where permittees are permitted by the NPDES permit writer to monitor less frequently, but those should only be in situations where the effluent is stable, and toxicity has not been observed in previous toxicity testing. For NPDES WET limitations, permitting authorities must include WET limits in their NPDES permits where reasonable potential has been demonstrated. For more information on EPA’s reasonable potential NPDES requirements and implementation, there is another module in this series specifically on WET reasonable potential, Determining WET Reasonable Potential for NPDES Permitting, hereafter the reasonable potential module. Over the next few slides, we will focus in on the first two important aspects just mentioned: WET criteria and representative toxicity monitoring.



The slide is titled "Water Quality Criteria Components and Definitions" in a green arrow-shaped header. It lists three components: Magnitude, Duration, and Return Frequency, each with a definition. The slide has a blue background with green and white text boxes. At the bottom, there is a green footer bar with the USEPA logo, the text "USEPA HQ – NPDES WET Online Training Curriculum", and the number "10".

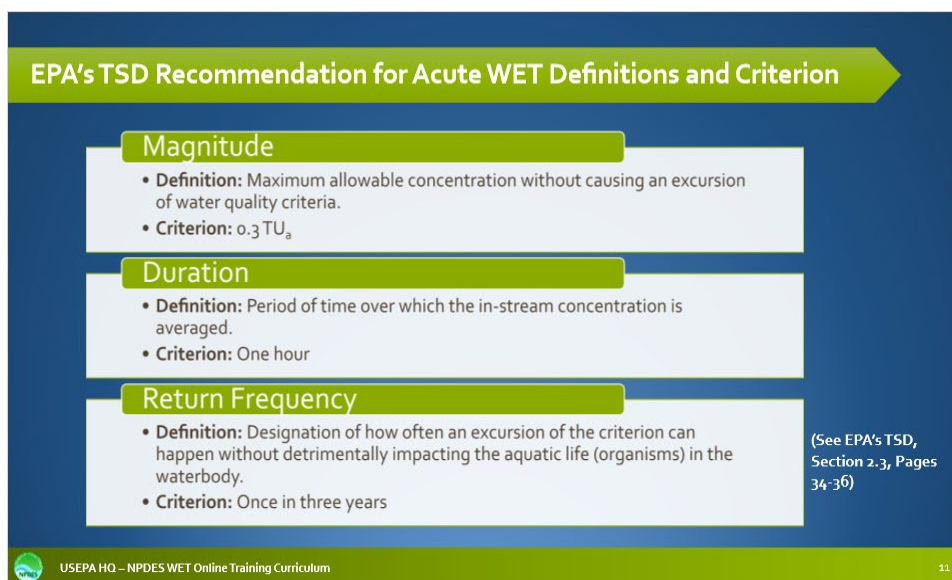
Water Quality Criteria Components and Definitions

- Magnitude**
 - **Definition:** Maximum allowable concentration without causing an excursion of water quality criteria.
- Duration**
 - **Definition:** Period of time over which the in-stream concentration is averaged.
- Return Frequency**
 - **Definition:** Designation of how often an excursion of the criterion can happen without detrimentally impacting the aquatic life (organisms) in the waterbody.

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Notes:

All water quality criteria including WET criteria have three components: magnitude, duration, and return frequency. Magnitude is the maximum allowed concentration without causing an excursion of applicable water quality criteria and standards, while the duration is the period of time over which the in-stream concentration is averaged. The return frequency is a designation of how often an excursion of the criterion can happen without detrimentally impacting aquatic life in the waterbody. In the next slide, we will examine how these three components are defined in terms of the acute WET criterion.



The slide features a dark blue background with a light green header bar at the top containing the title "EPA's TSD Recommendation for Acute WET Definitions and Criterion". Below the header, there are three stacked light green boxes, each with a title and two bullet points. The first box is titled "Magnitude" and contains the definition "Maximum allowable concentration without causing an excursion of water quality criteria" and the criterion "0.3 TU_a". The second box is titled "Duration" and contains the definition "Period of time over which the in-stream concentration is averaged" and the criterion "One hour". The third box is titled "Return Frequency" and contains the definition "Designation of how often an excursion of the criterion can happen without detrimentally impacting the aquatic life (organisms) in the waterbody" and the criterion "Once in three years". To the right of these boxes, a small text note states "(See EPA's TSD, Section 2.3, Pages 34-36)". At the bottom left, there is a small EPA logo and the text "USEPA HQ - NPDES WET Online Training Curriculum". At the bottom right, the number "11" is displayed.

EPA's TSD Recommendation for Acute WET Definitions and Criterion

- Magnitude**
 - **Definition:** Maximum allowable concentration without causing an excursion of water quality criteria.
 - **Criterion:** 0.3 TU_a
- Duration**
 - **Definition:** Period of time over which the in-stream concentration is averaged.
 - **Criterion:** One hour
- Return Frequency**
 - **Definition:** Designation of how often an excursion of the criterion can happen without detrimentally impacting the aquatic life (organisms) in the waterbody.
 - **Criterion:** Once in three years

(See EPA's TSD, Section 2.3, Pages 34-36)

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Notes:

EPA WET criteria are based upon the same three key components as chemical-specific water quality criteria mentioned in the last slide: magnitude, duration, and return frequency. In EPA's 1991 Technical Support Document for Water Quality-based Toxics Control, commonly referred to as the EPA's TSD, the magnitude for the acute WET criterion is recommended to be 0.3 toxic units acute, or TU_a. Toxic units are defined as 100 divided by the statistical endpoint, which for acute WET is the LC₅₀, or the concentration that is lethal to 50 percent of the aquatic test organisms. Using acute TUs rather than the LC₅₀ value makes the level of toxicity more intuitive, because as the TUs increase, the toxicity magnitude increases directly. This means that as the TUs increase, a smaller percentage of the effluent will result in an impact on aquatic life. TUs will be further discussed in the reasonable potential module. The recommended duration component for the acute WET criterion is one hour, and the return frequency is once in three years.

Why is the Recommended Acute WET Criterion Set at 0.3 TU_a?

EPA's recommended acute WET criterion of 0.3 TU_a approximates an LC₁, or almost no acute toxicity.

(See EPA's TSD Section 2.3.3)

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Notes:

Why is the recommended acute WET criterion set at 0.3 TU_a? This is EPA's recommendation in EPA's TSD because it approximates an LC₁, or one percent mortality, which is almost no acute toxicity. As noted in EPA's TSD Section 2.3.3, the factor of 0.3 TU_a was found to include 91 percent of the observed LC₁ to LC₅₀ ratios in 496 effluent toxicity tests.

How Can 0.3 TU_a be Measured in a WET Test?

- The WET test endpoint could be specified in terms of “no statistically significant difference in acute toxicity between 100 percent effluent sample and the control.”

(See EPA's TSD Section 5.7.4, Pages 112 – 113)

- If a zone of initial dilution (ZID) is allowed in applicable water quality standards or permitting regulations, then the WET test endpoint could be expressed as a specified effluent concentration rather than end of pipe (e.g., no significant difference in acute toxicity in any effluent test concentration at or below the in-stream waste concentration [IWC] and the control).



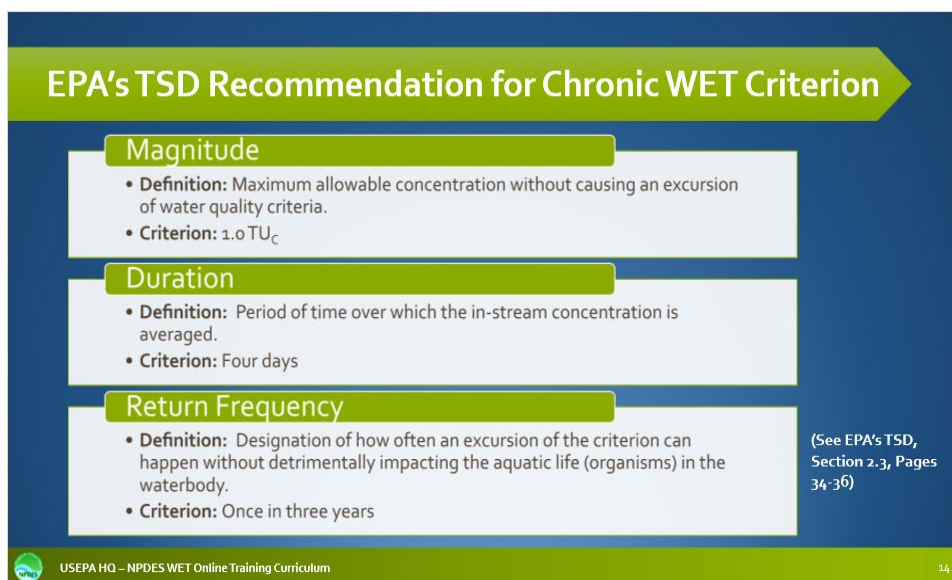
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Notes:

Many times, the question is asked: how can 0.3 TU_a be measured in a toxicity or WET test? If there is no zone of initial dilution allowed in the applicable water quality standards or permitting regulations, and the acute criterion is permitted at the end of pipe, then the NPDES WET acute limit would be expressed as “no statistically significant difference in acute toxicity between 100 percent effluent sample and the control.” This is the most sensitive application of an acute test and could be used for monitoring compliance with an acute criterion of 0.3 TU_a, where there is a lack of available dilution. In this case, the acute criterion would apply at the end of the pipe.

However, if the applicable water quality standards or permitting regulations allow for a zone of initial dilution, then the NPDES WET limit could be expressed as a specified effluent concentration accounting for the available dilution at the edge of the zone of initial dilution. For instance, the acute WET limit could be expressed as “no significant difference in acute toxicity in any effluent test concentration at or below the in-stream waste concentration, or IWC, and the control.”



The slide features a green header with the title 'EPA's TSD Recommendation for Chronic WET Criterion'. Below the header, three green boxes are arranged vertically, each containing a component of the criterion: Magnitude, Duration, and Return Frequency. Each box lists a definition and a criterion. A reference note is located to the right of the Return Frequency box. The footer includes the EPA logo, the text 'USEPA HQ - NPDES WET Online Training Curriculum', and the page number '14'.

EPA's TSD Recommendation for Chronic WET Criterion

- Magnitude**
 - **Definition:** Maximum allowable concentration without causing an excursion of water quality criteria.
 - **Criterion:** 1.0 TU_c
- Duration**
 - **Definition:** Period of time over which the in-stream concentration is averaged.
 - **Criterion:** Four days
- Return Frequency**
 - **Definition:** Designation of how often an excursion of the criterion can happen without detrimentally impacting the aquatic life (organisms) in the waterbody.
 - **Criterion:** Once in three years

(See EPA's TSD, Section 2.3, Pages 34-36)

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Notes:

We are now going to move from the acute WET criterion to the chronic WET criterion. As was demonstrated for the acute WET criterion, the chronic WET criterion has the same three components, including magnitude, duration, and return frequency. The magnitude of the chronic WET criterion is recommended in EPA's TSD to be 1.0 chronic toxic unit, or TU_c. Chronic toxic units are defined as 100 divided by the chronic endpoint, for example the Inhibition Concentration with a 25 percent effect, referred to as the IC₂₅, or a No Observed Effect Concentration, or NOEC. The recommended duration component of the chronic WET criterion is four days, which is a longer duration exposure to the effluent than the acute WET criterion duration exposure of one hour. This approach is used since chronic toxicity impacts to aquatic organisms are usually sub-lethal effects and not necessarily lethality. Therefore, the aquatic organism can sustain a longer exposure to the permitted effluent discharge. The return frequency remains the same for the acute and chronic WET criterion of once in three years.

Permit Expressions Used as a WET Limit or Monitoring Trigger of 1.0 TU_c

NOEC ≥ IWC

IC₂₅ ≥ IWC

No significant difference in test organism response between control treatment and IWC

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Notes:

There are multiple ways to express an NPDES WET limit or monitoring trigger of 1.0 TU_c. The first one listed here is based on the hypothesis endpoint, which is reported as a No Observed Effect Concentration, or NOEC; the permit limit or monitoring trigger would require the NOEC to be greater than or equal to the In-stream Waste Concentration, or IWC. This would ensure that the effluent discharge is not impacting aquatic life, because the IWC is a conservative estimate of the highest percentage of effluent that may be present in-stream under low flow conditions. A similar permit condition would be that the IC₂₅ is greater than or equal to the IWC. This permit condition expression uses a point estimate endpoint of a chronic toxicity test to meet the chronic WET criterion of 1.0 TU_c. In this case, there has to be less than or equal to a 25 percent effect at the IWC for the effluent to be considered compliant with the NPDES permit limit. A third option would be to require no significant difference in the toxicity test organism response between the control treatment and the IWC effluent test concentration.

Translating State WET Narrative or Numeric Criteria into Permit Requirements

Narrative WET Criteria:	Numeric WET Criteria:
<ul style="list-style-type: none">• Recommend using 0.3TU_a and 1.0TU_c as basis for deriving permit WET limits.• If effluent is determined toxic due to identified chemical cause (i.e., via toxicity identification evaluation, TIE) and is controlled using a chemical limit, then a WET limit may no longer be necessary.	<ul style="list-style-type: none">• Permitting authorities must permit for toxicity based on WET numeric criteria.• No exceptions: A WET limit must always be in the permit if reasonable potential, RP, is demonstrated, regardless of whether the chemical(s) cause is identified and can be controlled by a chemical limit(s).

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Notes:

There are a few recommendations when translating state WET narrative or numeric aquatic life protection criteria into NPDES permit requirements. For the narrative WET criteria, EPA recommends using 0.3 TU_a and 1.0 TU_c for acute and chronic WET criterion, respectively. This is the basis for deriving permit WET limits and for determining whether a WET limit is necessary based on a reasonable potential analysis. So, when using the narrative WET criteria, if the effluent is determined to be toxic or is shown to have a reasonable potential for toxicity, then an NPDES WET limit is required to be in the permit. However, if the chemical cause of toxicity is identified, typically using a Toxicity Identification Evaluation, or TIE, and the toxicity is reduced, abated, or eliminated by including a chemical-specific permit limit, then a WET limit may no longer be necessary and can be removed from the permit either through an existing permit re-opener clause or in the next permit renewal. It is always a good permit implementation practice to include in the revised permit's fact sheet the rationale and information that supports the removal of the NPDES WET limit. However, when a numeric WET criterion is part of a state's water quality standard, then the permitting authority must include a WET limit in the permit based on the WET numeric criteria for the protection of aquatic life when reasonable potential has been demonstrated, even if the chemical cause has been identified and a chemical limit is also included in the permit.

NPDES WET Permit Provisions

- NPDES permit must have WET limit if WET RP has been determined – 40 CFR 122.44(d)(1)(iv) and (v).
- Permit should contain toxicity monitoring requirements that are representative of the monitored effluent discharge(s).
- Permits must contain a general permit condition or citation that requires all toxicity tests be conducted using EPA's analytical methods at 40 CFR Part 136 (e.g., 2002 Toxicity Test Methods) or EPA's 1995 West Coast Short-term Chronic Toxicity Test Methods, where appropriate based on 40 CFR 122.21(j)(5)(viii).



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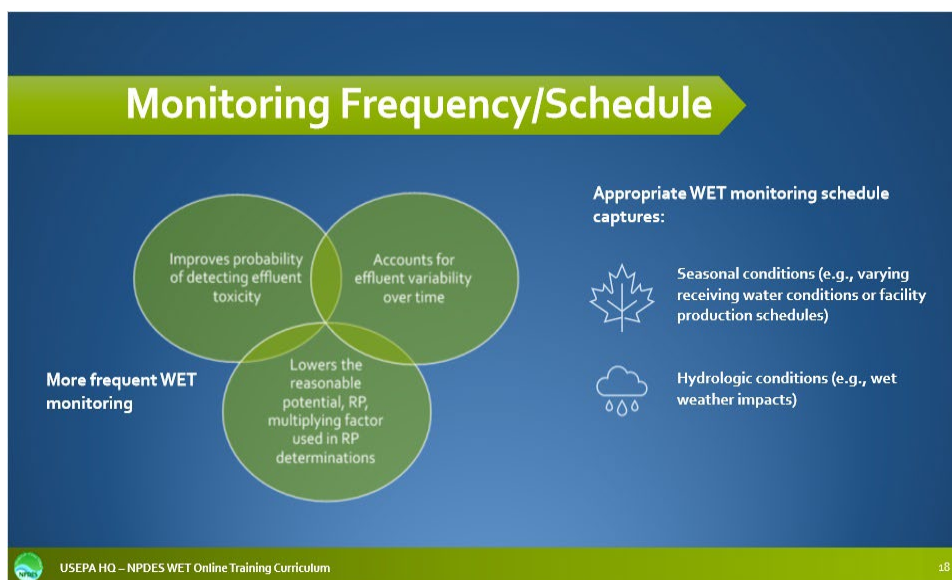
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Notes:

Let's review some of the provisions that need to be included in NPDES permits with respect to WET. NPDES permits must have an NPDES WET limit if reasonable potential has been determined. As we noted in the beginning of this module, this is in direct support of the Clean Water Act and included in EPA's NPDES permit regulations contained in 40 CFR 122.44(d)(1)(iv) and (v).

Once it is established that an NPDES permit must contain a WET limit, the permit should contain toxicity monitoring requirements that are representative of the effluent discharge as required by EPA's reasonable potential regulations, as well as other NPDES permitting regulations. If the effluent being discharged tends to vary either in flow or chemical composition over time or perhaps seasonally; quarterly or more frequent toxicity monitoring should be included to characterize the potential variability in the effluent. Effluents that have been demonstrated to be more stable in terms of concentrations of potential contaminants of concern may be able to be characterized at a toxicity monitoring frequency less than quarterly. Another provision that should be included in NPDES permits with respect to WET, either directly or by reference, is that toxicity tests are to be conducted using EPA's toxicity test methods at 40 CFR Part 136. The promulgated toxicity test methods at 40 CFR Part 136 include the 2002 acute freshwater and marine toxicity test methods, the 2002 short-term chronic freshwater toxicity test methods, and the 2002 short-term chronic marine toxicity test methods. EPA's 1995 West Coast short-term chronic marine toxicity test methods are the recommended toxicity test methods for conducting chronic marine toxicity tests on the West Coast as allowed

under 40 CFR 122.21(j)(5)(viii). Let's take a closer look at the need for a representative toxicity monitoring frequency or schedule to be included in the NPDES permit.



Notes:

Including a representative or better yet a rigorous monitoring frequency or schedule in the permit will support properly characterizing the permitted effluent in terms of reasonable potential, or RP, for WET and for WET permit limit compliance. More frequent toxicity monitoring will improve the probability of detecting effluent toxicity if present, will take into account effluent variability over time, and will lower the reasonable potential multiplying factor used in RP determinations, as discussed further in the reasonable potential module. An appropriate toxicity monitoring schedule will aid in capturing important seasonal conditions, such as varying in-stream conditions or facility production schedules, and may also support characterizing certain hydrologic conditions, such as storm water impacts. The next slide will illustrate the use of more frequent toxicity monitoring in terms of capturing potential toxicity in the permitted effluent.

WET Monitoring Frequency (Potential for Capturing or Missing Toxicity)	Quarter 1			Quarter 2			Quarter 3			Quarter 4		
	Months											
	1	2	3	4	5	6	7	8	9	10	11	12
Monthly	X	X	X	X	X	X	X	X	X	X	X	X
Quarterly (1 st month)	X			X			X			X		
Quarterly (Anytime)	X					X	X				X	
Bi-Annually	X						X					
Annually							X					

Upset due to Ammonia or Pesticide Spill

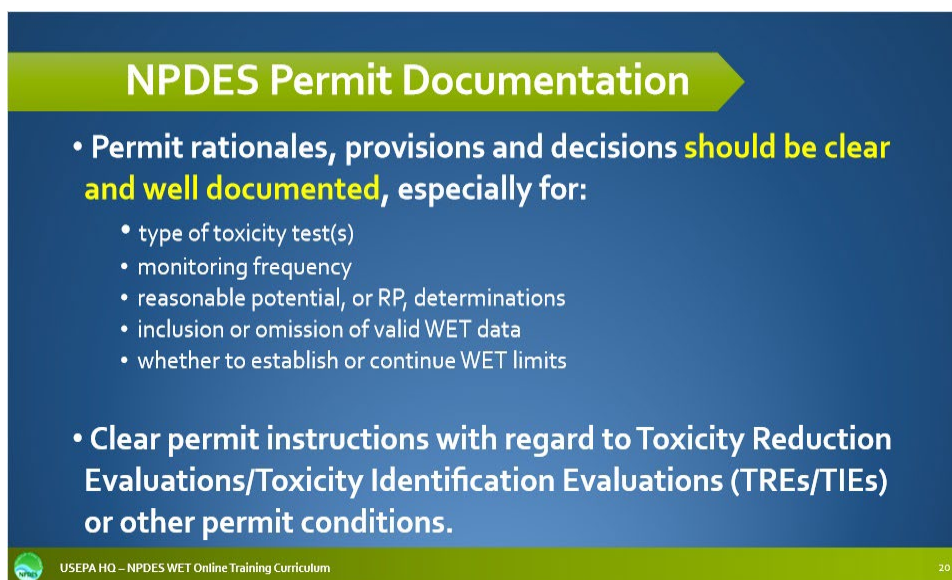
More Persistent Toxicant

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Notes:

Let's take a closer look at using different toxicity monitoring frequencies or schedules in NPDES permits. At the horizontal top of the chart are the quarters and the months of the year, and down the vertical side are the various potential toxicity monitoring frequencies, including monthly, quarterly during the first month of the quarter, quarterly during any month of the quarter, bi-annually, and annual toxicity testing. Now, for example, imagine that there is a wastewater treatment upset at a facility and that there is high effluent ammonia, or perhaps a toxic spill, such as a pesticide that has not been completely treated. If the effluent discharger is monitoring at a high frequency, perhaps monthly, toxicity during these events may be captured. However, if a less frequent toxicity monitoring schedule is used, the probability of observing such toxic events in a toxicity test decreases. Another example might be if a more persistent toxicant was present in a permitted effluent; then perhaps monthly or quarterly toxicity testing may be sufficient to characterize the possible toxicity due to the discharged effluent. However, even in the case of a persistent toxicant, less frequent toxicity testing, for example only bi-annually or annually, will have less of an opportunity to capture toxic impacts based on the toxicity test.

A presentation slide with a blue background and a green header bar. The header bar contains the title "NPDES Permit Documentation" in white. The main content area is blue and contains two bullet points. The first bullet point is "Permit rationales, provisions and decisions should be clear and well documented, especially for:" followed by a list of four sub-bullets: "type of toxicity test(s)", "monitoring frequency", "reasonable potential, or RP, determinations", and "inclusion or omission of valid WET data". The second bullet point is "Clear permit instructions with regard to Toxicity Reduction Evaluations/Toxicity Identification Evaluations (TREs/TIEs) or other permit conditions." At the bottom left is a small green circular logo with a white 'e' and the text "USEPA HQ - NPDES WET Online Training Curriculum". At the bottom right is the number "20".

NPDES Permit Documentation

- Permit rationales, provisions and decisions **should be clear and well documented**, especially for:
 - type of toxicity test(s)
 - monitoring frequency
 - reasonable potential, or RP, determinations
 - inclusion or omission of valid WET data
 - whether to establish or continue WET limits
- Clear permit instructions with regard to Toxicity Reduction Evaluations/Toxicity Identification Evaluations (TREs/TIEs) or other permit conditions.

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Notes:

When it comes to implementing WET into NPDES permits, clear and well documented rationales, provisions, and decisions regarding WET should be included in the permit fact sheet or administrative record. Provisions that should be clearly documented include what is expected of the permittee with respect to the types of toxicity tests to be conducted, the required toxicity monitoring frequency, and how the generated valid toxicity test data is used or not used in reasonable potential determinations and NPDES permit compliance. If toxicity data generated over the course of a previous permit cycle is not used, the reasons for not using certain data or using other data needs to be clearly explained in the permit fact sheet or administrative record. If the NPDES WET limit is being modified or the toxicity monitoring frequency is being revised, the basis for any revisions needs to be clearly stated in the permit fact sheet or administrative record to prevent confusion on the part of the permittee, the laboratory, or future NPDES permit writers. Anything included in the NPDES permit becomes an enforceable requirement under EPA's NPDES permit regulations.

Another important aspect that needs to be clear and well documented in the NPDES permit is any instructions with regard to Toxicity Reduction Evaluations/Toxicity Identification Evaluations, also known as TREs/TIEs. These toxicological evaluations are not requirements under EPA's NPDES regulations, but if they are included in an NPDES permit, then they become a requirement by virtue of inclusion into the permit. Therefore, clear and well-written instructions and expectations for what the permittee is to achieve regarding TREs/TIEs, including a

detailed work plan and schedule, should be included in the permit.

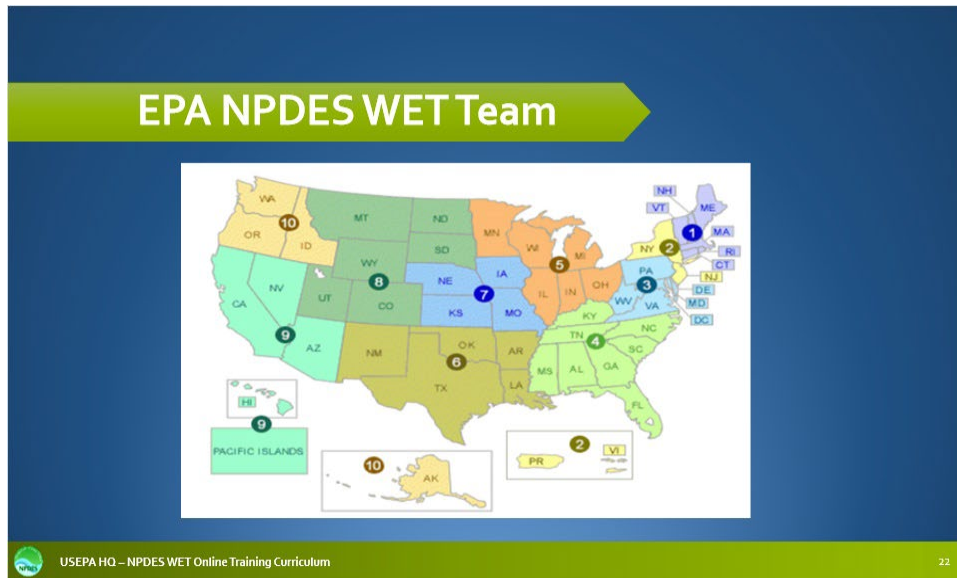
NPDES WET Program Oversight

- Coordination between EPA Headquarters and EPA regions on NPDES WET program implementation and permits.
- Provide NPDES WET training and expert technical support to permitting authorities.
- Review recommendations from stakeholders, permitting authorities, and EPA regions on NPDES WET program implementation approaches.



Notes:

This module provides an overview of EPA's NPDES WET permit program. Permit writers need to provide well written NPDES permits which include documentation of WET permit decisions and requirements. For most of the U.S., the permitting authorities have authorization to issue permits for the NPDES permit program. These permitting authorities have been granted NPDES permit authorization by EPA over their NPDES permit program but they also coordinate with EPA regions. The EPA regions work with EPA Headquarters, as necessary, on the implementation of NPDES permit programs. Other aspects of EPA's NPDES permit program coordination and oversight include providing EPA Headquarters NPDES WET training and expert technical support to permitting authorities, including this EPA Headquarters NPDES WET online course. The NPDES WET permit program coordination also considers recommendations from stakeholders, permitting authorities, and EPA regions on the EPA NPDES WET permit program implementation approaches to make advancements or adjustments when appropriate and as necessary.



Notes:

The EPA NPDES WET team is made up of an EPA National WET Coordinator in the Water Permits Division with-in the Office of Wastewater Management at the EPA Headquarters in Washington, D.C. and at least one NPDES WET Coordinator in each EPA region.

The slide has a dark blue background with a green arrow pointing right at the top containing the title 'EPA NPDES Resources'. Below the title, there are two lines of text, each followed by a URL. The first line is 'EPA Office of Water/Office of Wastewater Management website:' followed by the URL <https://www.epa.gov/npdes>. The second line is 'EPA Office of Water/Office of Science and Technology website:' followed by the URL <https://www.epa.gov/cwa-methods/whole-effluent-toxicity-methods>. At the bottom left is a small EPA logo and the text 'USEPA HQ - NPDES WET Online Training Curriculum'. At the bottom right is the number '23'.

EPA NPDES Resources

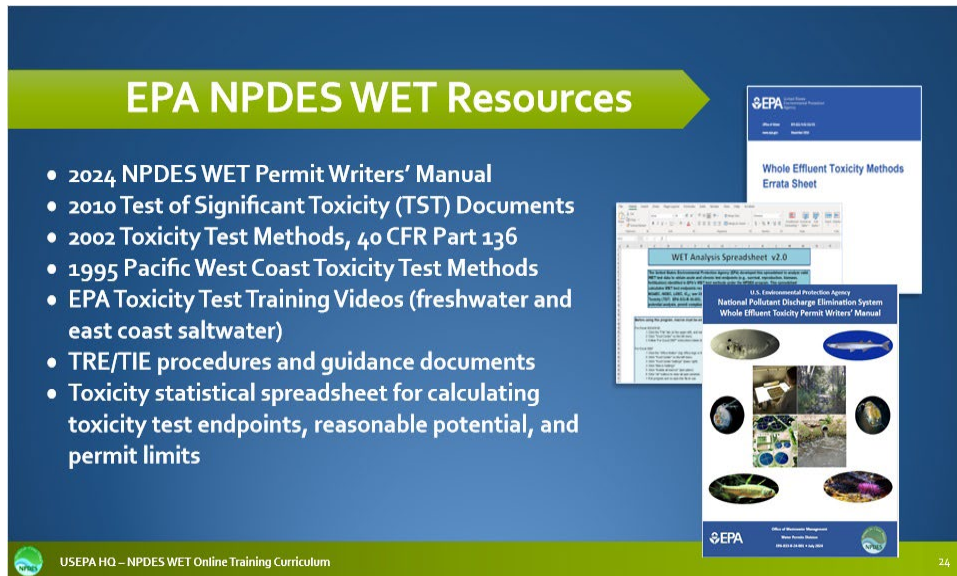
EPA Office of Water/Office of Wastewater Management website:
<https://www.epa.gov/npdes>

EPA Office of Water/Office of Science and Technology website:
<https://www.epa.gov/cwa-methods/whole-effluent-toxicity-methods>

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Notes:

Besides the EPA Headquarters NPDES WET online training that you are viewing, there are many other WET resources on the web pages of EPA's Office of Wastewater Management as well as EPA's Office of Science and Technology. EPA's Office of Wastewater Management is the office that manages the NPDES WET permit program with EPA regions and NPDES states, while the Office of Science and Technology and Office of Research and Development are responsible for developing, updating and managing the EPA toxicity test methods, including their inclusion into 40 CFR Part 136. The links here provide access to the NPDES web page of the Office of Wastewater Management where several documents, guidance, policy and other tools can be accessed to use towards NPDES WET permits implementation. The Office of Science and Technology link provides access to where the EPA 2002 promulgated toxicity test methods can be found on the web. On the next slide we will review a few of these important documents that can be accessed on the web.



The slide features a green header with the title "EPA NPDES WET Resources". Below the header, a bulleted list of resources is provided. To the right of the list, three overlapping images are displayed: the top image is the "Whole Effluent Toxicity Methods Errata Sheet", the middle image is a screenshot of the "WET Analysis Spreadsheet v2.0", and the bottom image is the cover of the "Whole Effluent Toxicity Permit Writers' Manual". The footer of the slide includes the EPA logo, the text "USEPA HQ - NPDES WET Online Training Curriculum", and the page number "24".

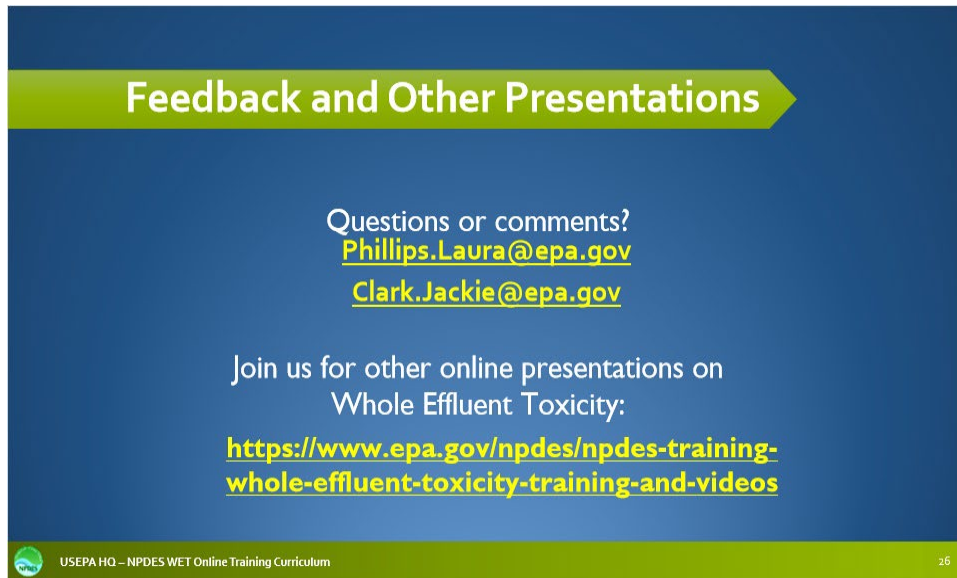
EPA NPDES WET Resources

- 2024 NPDES WET Permit Writers' Manual
- 2010 Test of Significant Toxicity (TST) Documents
- 2002 Toxicity Test Methods, 40 CFR Part 136
- 1995 Pacific West Coast Toxicity Test Methods
- EPA Toxicity Test Training Videos (freshwater and east coast saltwater)
- TRE/TIE procedures and guidance documents
- Toxicity statistical spreadsheet for calculating toxicity test endpoints, reasonable potential, and permit limits

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Notes:


There are many documents that have been published by EPA that are available on EPA's websites and cover different aspects of the NPDES WET permit program especially with respect to WET implementation. These include, but are not limited to, the EPA 2002 toxicity test methods available through the Office of Science and Technology's website. The EPA toxicity test methods training videos for the EPA's 2002 promulgated toxicity test methods can be found on the Office of Wastewater Management's NPDES website. In addition, several other NPDES WET documents can be accessed through the Office of Wastewater Management's Water Permits Division's NPDES website such as the NPDES WET Permit Writers' Manual, the Test of Significant Toxicity documents, EPA's guidance documents for conducting TREs/TIEs and other guidance for permit writers on recommended approaches for valid toxicity test data interpretation. All these reference documents can be found in the "Resources" tab of this module. EPA's Water Permits Division's NPDES website also includes a WET statistical spreadsheet. EPA HQ's toxicity spreadsheet statistical tool is Excel-based and will calculate several existing EPA toxicity statistical test endpoints and other NPDES WET permit calculations.



Feedback and Other Presentations

Questions or comments?
Phillips.Laura@epa.gov
Clark.Jackie@epa.gov

Join us for other online presentations on
Whole Effluent Toxicity:
<https://www.epa.gov/npdes/npdes-training-whole-effluent-toxicity-training-and-videos>

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Notes:

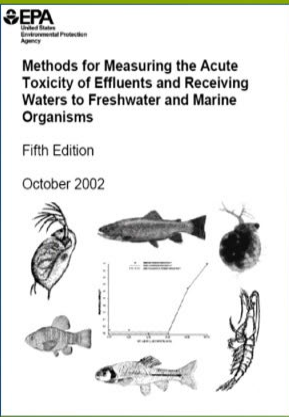
Thank you for joining us for this EPA's NPDES Whole Effluent Toxicity training presentation. We hope that you have enjoyed it!

If you have any questions or comments on this or any part of the EPA's NPDES WET online training curriculum, click on the email address given on this slide to send a message to Laura Phillips or Jackie Clark, EPA Headquarters NPDES WET Coordinators.

Remember, you will find all the EPA's NPDES WET online training presentations, under the EPA's NPDES training section found on the Office of Wastewater Management's NPDES website.

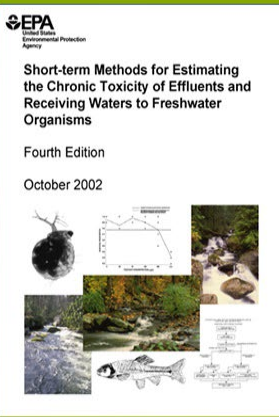
See you next time!

EPA Acute and Chronic Freshwater Toxicity Test Methods



Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms

Fifth Edition
October 2002



Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms

Fourth Edition
October 2002

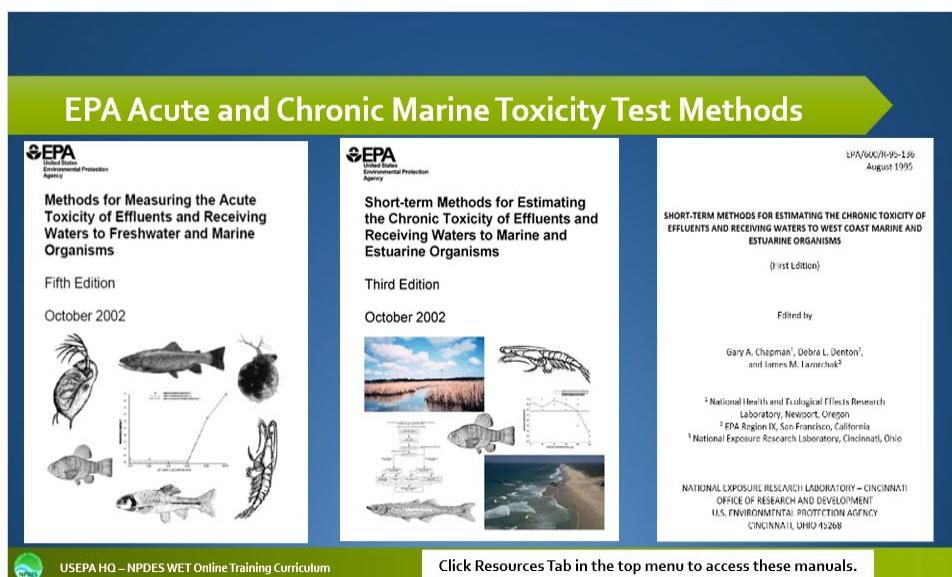
Click Resources Tab in the top menu to access these manuals.

[Click Here for EPA Acute and Chronic Marine Toxicity Test Methods](#)

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Notes:

The module presented here examines EPA's freshwater acute toxicity test methods entitled *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, Fifth Edition, EPA-821-R-02-012, hereafter acute toxicity test methods. In addition, this module provides EPA's short-term chronic freshwater toxicity test methods entitled *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, Fourth Edition, EPA-821-R-02-013, hereafter chronic toxicity test methods.



Notes:

This course also provides an opportunity to view EPA's acute marine toxicity test methods entitled *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, Fifth Edition, EPA-821-R-02-012, hereafter acute toxicity test methods; short-term chronic marine toxicity test methods used by states on the Atlantic Ocean or Gulf of Mexico entitled *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms*, Third Edition, EPA-821-R-02-014, hereafter East Coast chronic toxicity test methods; or short-term chronic marine toxicity test methods used by states on the Pacific Ocean entitled *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms*, First Edition, EPA-600-R-95-136, hereafter West Coast chronic toxicity test methods.